# Unit 1

## Lesson 1

## Attempts of Elements Classification

**A)-Mendeleev's periodic table**

**1-Elements are arranged ascendingly according to their atomic weights**

**Advantages of Mendeleev's table.**

**1-Mendeleev predicted the ability of discovering new elements. So he left spaces (empty cells) in his table,**

**2-he corrected the wrong estimated atomic weights of some elements.**

**and disadvantages of Mendeleev's table**

**1-He had to make a disturbance in the ascending order of atomic weights for some elements, due to putting them in groups which suit their properties,**

**2-he also would have to deal with the isotopes of one element as different elements because they are different in their atomic weights.**

**B) Rutherford discovered that the nucleus of atom contains positively charged protons,**

**C) Moseley's periodic table**

**are arranged ascendingly according to their atomic numbers.**

**D)Bohr discovered the main energy levels**

**• Each main energy level contains a number of energy sublevels.**

**s block has 2 groups** **p block has 7 groups** **d block has 10 groups**

**f block has 14 groups**

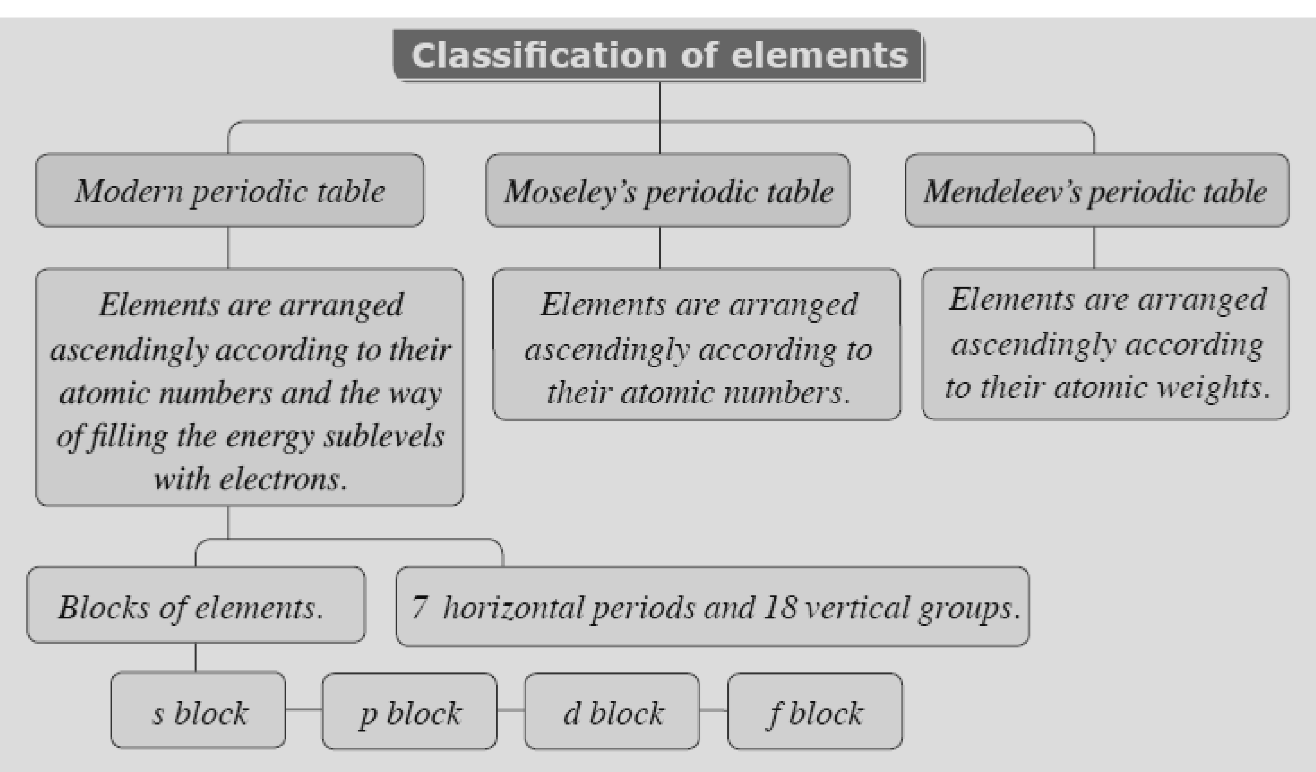
**E) Modern periodic table has 7 horizontal periods and 18 vertical groups**

**Elements are arranged ascendingly according to their atomic numbers and the way of filling the energy sublevels with electrons.**

**- The number of known elements until now are 118 elements, 92 elements are abundant in the earth's crust, the rest of the elements are prepared artificially.**

**- Elements of (A) groups lie on the left and right of the table, you can locate their position in the modern periodic table by knowing their atomic numbers and vice versa.**

**- The elements of (B) groups lie in the middle of the table**




- *Each main energy level contains a number of energy sublevels.*
- *Transition elements start to appear in the fourth period.*
- *Number of period of the element = Number of energy levels occupied by electrons.*
- *Number of group of the element = Number of electrons in the outermost energy level in its*

| Element | $_{20}Ca$ | $_{15}P$ | $_{10}Ne$ | $_{1}H$ |
|---|---|---|---|---|
| * Electronic configuration | +20 )))) | +15 ))) | +10 )) | +1 ) |
| * Energy levels | .............................. | .............................. | .............................. | .............................. |
| * Number of period | .............................. | .............................. | .............................. | .............................. |
| * Number of electrons in outermost energy level | .............................. | .............................. | .............................. | .............................. |
| * Number of group | .............................. | .............................. | .............................. | .............................. |

## Evaluation on lesson 1

□**Complete**:

**(1) Mendeleev arranged the elements ascendingly according to .........**

**while Moseley arranged them ascendingly according to .........**

**(2) The modern periodic table consists of ......... horizontal periods , ......... vertical groups.**

□**What is the scientific base on which the modern periodic table classified ?**

□**Locate the position of the following elements in the modern periodic table :**

**(1) $_{1}H$ ...................................**

**(2) $_{10}Ne$ ...................................**

**(3) $_{20}Ca$ ...................................**

□**Find the atomic number for the following elements.**

**(1) Element X lies in the first period and zero group .........**

**(2) Element Y lies in the second period and 3A group .........**

**(3) Element Z lies in the third period and 7A group .........**

**Classify the elements into two groups :**

**$_{2}He$ – $_{3}li$ – $_{19}K$ – $_{10}Ne$ – $_{11}Na$**

..........................................................................................

## Lesson 2

## Graduation of Elements in the Modern Periodic Table

**1 Atomic size property :**

**1-The atomic size of the same period decreases by the increase of their atomic numbers.**

**Due to The increase of the attraction force between positive nucleus and the electrons in the outermost energy level.**

**2-The atomic size of the same group increases by the increase of their atomic numbers due to the increase of the number of the energy levels in the atoms.**

**2 The electro negativity property:**

**□ Electronegativity : Is the ability of an atom in the covalent compound to attract the bonded electrons to itself**

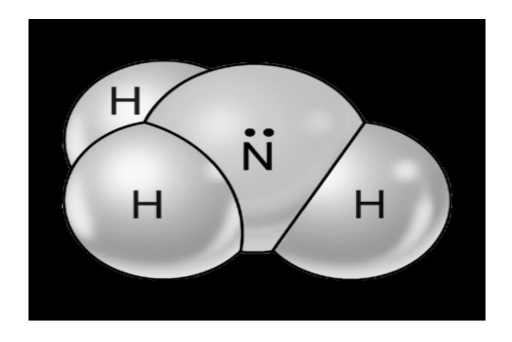
**□By increasing the atomic number the electronegativity of elements of the same period increases, but it decreases in the same group.**

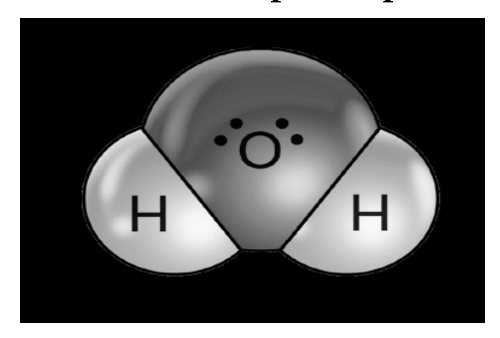
**□The electronegativity of flourine element is the highest value and equals 4**

***The polar compounds***

**is a covalent compound, the electronegativity difference between its elements is relatively high.**

**Water molecule and ammonia molecule are from examples of polar compounds**




**– Elements are divided into 4 main kinds, which are :**

- **Metals.**
- **Nonmetals.**
- **Semimetals (Metalloids).**
- **Inert gases.**

**metalloids. Are Elements have both properties of metals and nonmetals**

**3-The metallic and nonmetallic property:**

„[ **Metallic property** of the ***same group*** **increases by the increase of the atomic number as we go from up to down (as in group 1A) due to the increase of the atomic size, while** **nonmetallic property** **decreases (as in group 7A) due to the decrease of electronegativity values.**

„[ ***The period*** **starts with strong metal, as the atomic number increases in the same period the metallic property decreases gradually until we reach semimetals and then nonmetals start appear and as the atomic number increases, the nonmetallic property increases until we reach the strongest nonmetal in group 7A.**

**The chemical properties of metals :**

**1-Some metals react with dilute acids forming salt of acid and hydrogen gas**

$Mg + 2HCl \xrightarrow{Dil.} MgCl_2 + H_2$

**Magnesium +Hydrochloric acid → Magnesium chloride+ Hydrogen**

**2-Metals react with oxygen forming metallic oxides which are known as basic oxides.**

$2Mg + O_2 \longrightarrow 2\,MgO$

**Magnesium + Oxygen → Magnesium oxide**

**3-*Basic oxides which dissolve in water form alkalis:**

$MgO + H_2O \longrightarrow Mg(OH)_2$

**Magnesium oxide + Water → Magnesium hydroxide**

**Chemical activity series : Is the descending arrangement of elements according to their chemical activities.**

**Metals and Their behaviour with water**

1- **K Potassium and Na Sodium React instantly with water and $H_2$ evolves**
2- **Ca Calcium and Mg Magnesium React very slowly with cold water**
3- **Zn Zinc and Fe Iron React in high temperature with only hot water vapour.**
4- **Cu Copper and Ag Silver Don’t react with water.**

**The chemical properties of nonmetals :**

**1- Nonmetals don't react with the acids.**

**2 Nonmetals react with oxygen forming non-metal oxides. Most of them are known as acidic oxides.**

**$C + O_2 \longrightarrow CO_2$**

**Carbon +Oxygen ⟶ Carbon dioxide**

**3-The nonmetal oxide dissolves in water forming acids.**

**$CO_2 + H_2O \longrightarrow H_2CO_3$**

**Carbon dioxide +Water ⟶ Carbonic acid.**

## Questions on lesson 2

**Put (.) or (.) in front of the following statements and correct the wrong ones:**

**(1) The atomic size increases by the increase of the atomic number. ( )**

**(2) Water and ammonia are from polar compounds. ( )**

**(3) Some alkalis dissolve in water forming bases. ( )**

**(4) The solutions produced from dissolving the non-metal oxides in water turn the violet litmus solution into red. ( )**

**2-Choose the correct answer between brácktes:**

**(1) Each period in the modern periodic table starts with .......... element.**

**( metallic - semimetallic - nonmetallic - inert )**

**(2) In the same period, the element which has the highest electro negativity lies in group .......... (0 - 7 A - 2 A - 1 A)**

**(3) When sodium react with water .......... gas evolves. (O2 - CO2 - H2 -N2)**

**3-What is meant by :**

**(1) Metalloids ..........**

**(2) Chemical activity series ..........**

**4- Explain the behaviour of the following elements with water:**

**(1) Iron ..........        (2) Silver ..........        (3) Potassium ..........**

**5-Write the balanced chemical equations which express reaction of :**

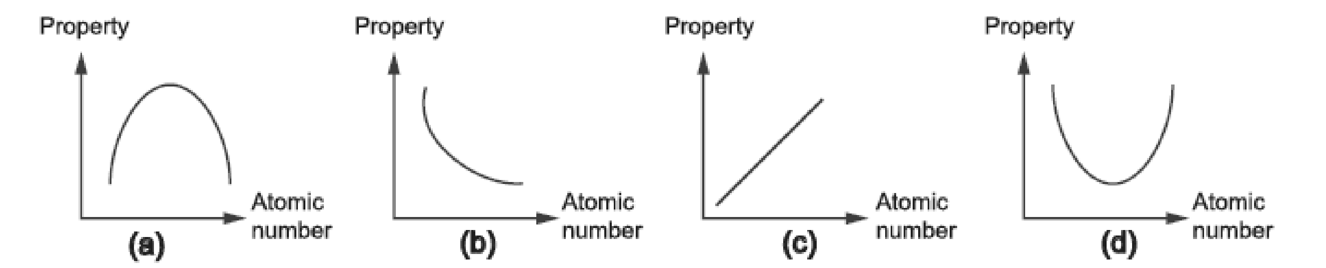
**(1) Carbon dioxide with water.**

**(2) Magnesium with dil. hydrochloric acid**

**❻ Which of the following figures repressents:**

(1) **Graduation of electronegativity property in the second period.** ( ...................... )

(2) **Graduation of the atomic size in the third period.** ( ...................... )




## Lesson 3

## The Main Groups in the Modern Periodic Table

**1Alkali metals group (Group 1) :**

**group 1A lies in the maximum left of the periodic table**

**their metals are named alkali metals because they react with water forming alkali solutions.**

**2 Na + 2 H2O ⟶ NaOH + H2**

**General properties of alkali metals :**

**1-They are mono-valent elements because their outermost shells contain (1) electron.**

**2-They tend to lose their valency electron forming positive ions that carries one positive charge.**

**3-They are chemically active elements so they are kept under kerosene or paraffin to prevent their reaction with the moist air.**

**4-Their chemical activity increases by the increase of atomic size.**

**Cesium (Cs) is considered as the most active metal in general.**

**5-They are good conductors of heat and electricity.**

**6-Most of them have low density**

## 2Alkaline Earth metals (Group 2)

**General properties of alkaline Earth metals :**

**1-They are divalent elements because they contain 2 electrons in their outermost (valency) shells.**

**2-They tend to lose their valency electrons forming positive ions that carry two positive charges.**

**3-They are less active than alkali metals.**

**4-Their chemical activity increases by the increase of the atomic size because the loss of the valency electrons becomes easier.**

**5-They are good conductors of heat and electricity.**

**6□They have more density than alkali metal**

### 3Halogens group (17)

**the group 17 lies on the right side of the periodic table, it is one of (p) block groups, salts formations, because they react with metals forming salts.**

**K + Br ⟶ KBr**

**Potassium +Bromine ⟶ Potassium bromide**

**General properties of halogen elements :**

**□They are mono-valent nonmetals ... Why ?**

**□They exist as diatomic molecules F2 , Cl2 , .................................................................**

**□They are chemically active elements, so they do not exist individually in nature but they exist in chemical compounds, except astatine which is prepared artificially.**

**□Each element in the group replaces the element below it in their solutions.**

**Cl2 + 2KBr ⟶ 2KCl + Br2**

**Clorine+ Potassium bromide ⟶ Potassium chloride +Bromine**

**Br2 + 2KI ⟶ 2KBr + $I_2$**

**Bromine +Potassium Iodine ⟶ Potassium bromide +Iodine**

**□The physical state is graduated from the gaseous state (Flourine , Chlorine) to the liquid state (Bromine) to solid state (Iodine).**

## The properties of elements and their uses

**1-Sodium is used in liquid state in transferring heat from inside the nuclear reactor to outside**
**2-Silicon slides are used in the manufacture of computers because they are semi-conductors**
**3-Liquified nitrogen is used in preservation of the cornea of the eye because it has a low boiling point**
**4-The radioactive cobalt 60 is used in food preservation because gamma rays which come out from it prevent the reproduction of microbial cells without an effect on human.**




**1** Choose the correct answer between brackets :

(1) .................. is considered from halogen. (Sodium - Chlorine - Helium - Calcium)

(2) .................. in its salt solution.
(Chlorine replaces bromine - Bromine replaces fluorine - Iodine replaces chlorine - Iodine replaces fluorine)

**2** Give reasons for :

(1) Elements of group (1A) are known as alkali metal.
..............................................................................................................................

(2) Liquified nitrogen is used in preservation of cornea of the eye.
..............................................................................................................................

**3** Study the opposite figure which represents a section of the periodic table, then answer.

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | N |
| A | | | | | | | | | | | | | I | K | | L | |
| | C | | | | | | | | | | | H | | | | | O |
| B | | | | D | | | E | | F | | G | | J | | | M | |

The letters in the table don't represent the actual symbols of the elements

(1) What is the symbols which indicates the :
(a) Inert gases. (b) Alkali metals.
(c) Halogens. (d) Alkaline Earth metals.

(2) What is the symbol which represents :
(a) The most active metal? (b) The most active nonmetal?

**4** Mention one use for each of the following elements in modern technology :

(1) Liquid sodium ..............................................................................................
(2) Silicon ..........................................................................................................
(3) Cobalt 60 ......................................................................................................

**5** The opposite table explains the properties of three elements, mention the symbol which represents an element from :

(1) Alkali metal ..........................
(2) Halogen ................................
(3) Alkalne Earth metals ............

| Element symbol | Behaviour with water | Physical state | Electric conduction | Density ($gm/cm^3$) |
|---|---|---|---|---|
| X | dissolve | gas | bad conductor | 0.003 |
| Y | react | solid | good conductor | 3.59 |
| Z | react instantly | solid | good conductor | 0.86 |

**6** Creative Thinking:

# Lesson 4

# Water

**Importance of water and its sources**

**using water in the world are: agriculture, industry, and personal uses.**

**Most of fresh water is used in planting crops of field.**

**- Sources of water in nature are :**

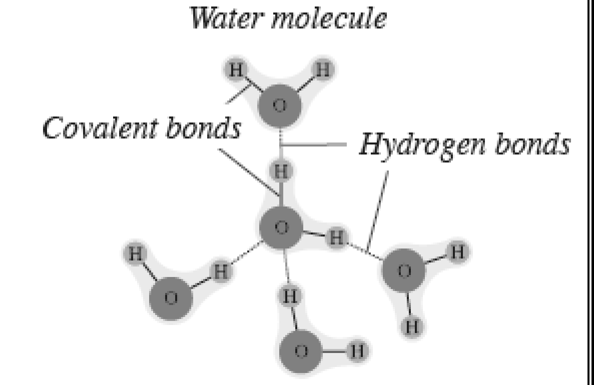
**(rivers , seas , oceans) rains, wells and springs**

**Water structure : $H_2O$**



**Formation of hydrogen bonds**

Due to large electronegativity of oxygen compared with hydrogen




Bonds between atoms and molecules in water

**hydrogen bonds the most important factors which are responsible for abnormality of water properties.**

**hydrogen bonds between…………………………..**

**covalent bonds between ……………………**

**Properties of water**

**1-Good polar solvent :**

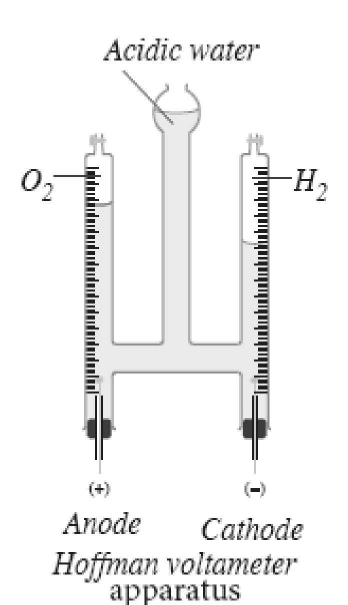
**2- Rising of its boiling and melting points**

**3- Water has low density when it freezes :The density of water when it is in a solid state is lower than its density when it is in a liquid state because when the temperature decreases than 4 °C, the water molecules are collected by hydrogen bonds forming.**

**Exercise (1)**

**Two equal masses of pure water, one of them is at 20 °C and the other is at 2 °C Which of them has the larger volume?.....................................**

7 -It has neutral effect on both of litmus papers



Hoffman voltameter apparatus

8 -Its resistance to analysis

water isn't analyzed into two elements or by the effect of heat,

it helps to keep water solutions in the cells of living organisms generally

**Hoffman voltameter** is used in electrolysis of water

$$\underset{\text{Water}}{2H_2O} \xrightarrow{\text{Electrolysis}} \underset{\text{Hydrogen}}{2H_2\uparrow} + \underset{\text{Oxygen}}{O_2\uparrow}$$

**Water Pollution**

Addition of any substance to water causes a continuous gradual change in its properties affecting the health and life of living organisms

Water pollution is divided into (2) main parts

1-nature pollutant ( volcanoes -- dust ……)

2-artificial pollutant:-

**1-Biological pollution:**

**2-Chemical pollution:**

1- Lead causes the death of brain cells, الرصاص يسبب موت خلايا المخ

2- Mercury leads to blindness. زئبق يسبب العمى

3- Arsenic infection by liver cancer الزرنيخ يؤدى الى سرطان الكبد

**3-Thermal pollution:**

**4 -Radiant pollution:**

**Protection of water from pollution :**

1-Getting rid of the phenomenon of discharging of sewage, factories wastes and dead animals in rivers or canals.

2-Development of water purification stations and making periodic analysis to determine the rate of its validity for drinking.

3-Spreading environmental awareness among people about protection of water from pollution.

4-Disinfecting drinking water tanks above buildings periodically.

5-Don't store the tap water in empty plastic bottles of mineral water because they react with chlorine gas which is used in disinfecting of water, so the rate of cancer infection increases.



## Questions on lesson 4

**□Choose the correct answer between brackets :**

**(1) All of the following are from the properties of water except ................. (neutral on both litmus paper / analysis by heat / increase in volume on heating / polar compound)**

**(2) There are ................. bonds between the water molecule.**

**(hydrogen / covalent / ionic / metallic)**

**(3) Alake contains: mineral salts, oxygen , fertilizer , animal wastes , green algea. How many pollutants are in it ? (1 / 2 / 3 / 4)**

**(4) A liquid boils at 100 ºC, what is the other property which affirm it is a pure water ?**

**(Sugar dissolves in it / when it freezers , denstiy decreases / neutral on both litmus paper / it evaporates on heating)**

**□Give reasons for :**

**(1) Presence of hydrogen bond between water molecule.**

**.......................................................................................................................................**

**(2) Pure water doesn't affect litmus paper dye.**

**.......................................................................................................................................**

**(3) Although sugar is a covalent compound , it dissolves in water.**

**.......................................................................................................................................**

**□What are the results of ?**

**(1) Water is polluted by the wastes of Man and animal.**

**.......................................................................................................................................**

**(2) Storing water in plastic bottles of mineral water**

**************************************************************************

# Unit Review

**□Choose:**

**(1) Scientists ..................... discovered the main energy levels in the atom**

**(Bohr / Mendeleev / Mosely / Hoffman)**

**(2) Sodium oxide from .................... oxides (amphoteric / acidic / nonmetallic / basic)**

**(3) All the following elements from semimetals except for ....................**

**(teleriun / silicorn / boron / bromine)**

**(4) The strongest metal lies in the .................. group. (2A / 1A / 1B / 7A)**

**□What is meant by ?**

**(1) Chemical activity series?**

**...........................................................................................**

**(2) Water pollution?**

**.........................................................................................................**

**(3) Semimetals?**

**.............................................................................................................**

**□How can you differentiate between magnesium oxide and sulphur oxide?**

**.......................................................................................................................................**

**.......................................................................................................................................**

**□What is the importance of ?**

**(1) Liquified nitrogen:**

**..................................................................................................**

**(2) Sodium :**

**..................................................................................................................**

**(3) Water :**

**.....................................................................................................................**

**□Give reasons for :**

**(1) The use of radio active Co 60 in food preservation.**

**...................................................................................................................................**

**(2) Elements of the same group have similar properties.**

**...................................................................................................................................**

**(3) The boiling point of water is high.**

..........................................................................................................................................

**(4) Alkali metals are kept under kerosene in the lab.**

..........................................................................................................................................

□**What is the effect of the following on the water environment?**

**(1) Drainage of factories wastes in rivers and seas.**

**(2) Using of rivers and seas water as a renewable source for cooling the nuclear reactor.**

**(3) Mixing of animal and Man wastes with water.**

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7 *The opposite figure represents a part of the periodic table , symbols represent some elements , study the figure then answer.*

*(1)What kind of : X - R - M - D elements.*

.....................................................................

.....................................................................

*(2) Mention the atomic number of element B.*

.....................................................................

.....................................................................

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | | | | | | | | | | | | | | | | | |
| N | | | | | | | | | | | | | | Z | B | J | |
| X | | | | | | | | | | | | | | L | | K | D |
| | R | | | | | M | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| E | | | | | | | | | | | | | | | | | |

*(3) What do the shaded area represent?*

..........................................................................................................................................

*(4) Mention the symbol which represents.*

** Most active element in group 1A.* .....................................................................

** The higher in the electronegativity in the third period*.....................................................

** The largest size element in the second period*.................................................................

# <u>Unit 2</u>

## The Atmosphere and protecting Planet Earth
## (Lesson 1)

**□ Atmospheric pressure is the weight of air column on a unit area.**

**□ Normal atmospheric pressure (at sea level) equals 1013.25 millibar**

**, an <u>altimeter</u> is used to determine the elevation of the navigation based on the atmospheric pressure at this level.**

**<u>Aneroid</u> It is a type of barometers, which is used to measure atmospheric pressure.**

### <u>Layers of atmospheric envelope</u>

### <u>First layer :Troposphere</u>

**Troposphere is the first layer of the atmosphere. It means the disturbed layer where most of the weather changes occur in this layer.**

**<u>Characteristics and importance of the troposphere:</u>**

**□It extends 13 km above sea level to the tropopause.**

**□As we go up, the temperature decreases by a rate of 6.5 ºC per 1 km until it reaches the lowest value of about (-60 ºC) at tropopause.**

**□Atmospheric pressures decreases as we go higher, where it reaches about 0.1 of the normal pressure at sea level.**

**□It contains about 75% of the atmosphere mass.**

**□It contains about 99% of the atmospheric water vapour, which organizes the earth’s temperature.**

**□The air movement in this layer is vertical as the warm air currents go up and the cold currents go down.**

**Exercise (3)**

**If the temperature at the base of mount Everest is 20.6 ؛C, how much is the temperature at its top if the mountain height is 886**

**Solution:**

**Height (km) =**

**……………………………………………………………………………..**

**The decrease in temperature = height (Km) v 6.5 =**

**…………………………………………..**

**Temperature at the top = temperature at the base – decrease in temperature**

**……………………**

**<u>Second layer: Stratosphere</u>**

## Characteristics and importance of the stratosphere

**□It extends from tropopause (13 km above sea level) to the stratopause (50 km) with thickness of 37 km.**

**□At the lower part, the temperature is constant and measure (– 60º C), then increases gradually until it reaches 0º C at the end of the layer. This is due to the absorption of ultraviolet radiation (emitted from The Sun) by the ozone layer that is present in the upper part of the layer.**

**□The atmospheric pressure decreases on going higher where it reaches the smallest value (0.001 of the normal pressure at sea level) at the end of the layer.**

**□It contains most of the atmospheric ozone which is concentrated between 20 - 40 km above sea level.**

**□The lower part does not contain clouds or suffer from any weather disturbances. The air moves in this part horizontally, making it suitable for flying planes**

**<u>Third layer: Mesosphere</u> It is the coldest layer**

## Characteristics and importance of the mesosphere:

**□It is extended from the stratopause (50 km above sea level) to the mesopause (85 km) with thickness of about 35 km.**

**□Temperature decreases with height rate until reaches (– 90º C) at its end.**

**□This layer is much vacuumed as it contains only a limited amount of helium and hydrogen gases.**

**□Meteors are formed in this layer and burnt due to friction with air molecules**

**<u>Fourth layer: Thermosphere</u>**

**It means the heated layer as it is the hottest layer of the atmosphere.**

## Characteristics and importance of the thermosphere :

**□It extends from the mesopause to 675 km above sea level with a thickness of about 590 km.**

**□Temperatures increase rapidly with going higher until it reaches about 1200º C.**

**□Its upper part contains charged ions. The distribution of the charged ions extends until 700 km above sea level; in a part known as <u>ionosphere.</u>**

**<u>Ionosphere</u> plays an important role in wireless communication Send Receive Reflection of radio waves from the ionosphere and broadcasting as it reflects radio waves that are transmitted by communication centers and radio stations**

 **Van Allen Belts** which are responsible for dissipating harmful cosmic rays away from the Earth.

**the Aurora phenomenon, which appears as brightly coloured light curtains at both the North and South poles of the Earth**



# Exosphere.

**This is the area where satellites float around the Earth and transmit weather condition information and TV programs.**

| الكلمة | معناها | الكلمة | معناها |
|---|---|---|---|
| Curtains | ستارة | brightly coloured | ضوء ملون |
| the Aurora phenomenon | الشفق القطبى | dissipating | يبدد -يشتت |
| cosmic rays | الأشعة الكونية | Communication | الأتصلات |
| Layers | طبقات | Broadcasting | بث ازاعي |
| Navigation | ابحار -ملاحه | | |
| elevation | ارتفاع | Layers of atmospheric envelope | طبقات الغلاف الجوي |

**Review of lesson 1**

**Choose the correct answer from statements between brackets:**

**a -Normal atmospheric pressure equals ……………. millibar.**

**(1013.25 / 76 / 1.013 / 760)**

**b- …………. is located between stratosphere and mesosphere.**

**(Tropopause / Stratopause / Mesopause / Thermopause)**

**c- Meteors burn in ……………**

**(mesosphere / ionosphere / exosphere / stratosphere)**

**□Give reasons for :**

**a- The lower part of the stratosphere is suitable for flying airplanes.**

**…………………………………………………………………………………...…..**

**b- Ionosphere is important for radio stations.**

**…………………………………………………………………………………...…..**

**□Mention the importance of each of the following:**

**a Van Allen's Belts ……………………………………………………...…………**

**b Altimeter ……………………………………………………………………………**

**c Satellites ……………………………………………………..…………………..**

**□What is meant by each of the following ?**

**a Atmospheric pressure.**

**……………………………………………**

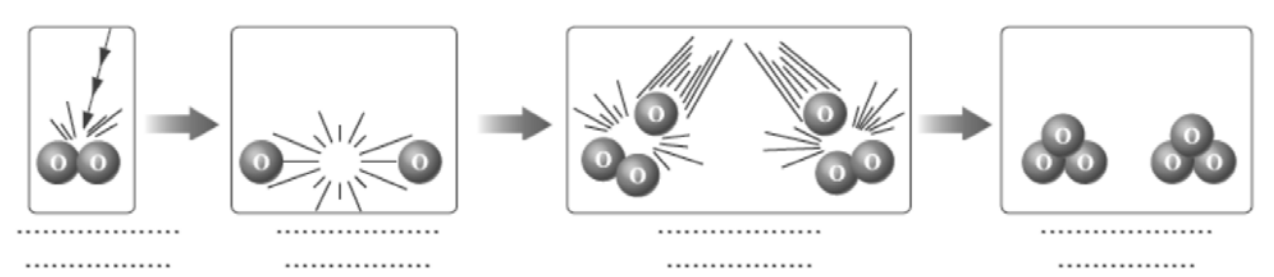
**b The aurora phenomenon.**

**……………………………….........……**

## <u>Lesson 2</u>
## <u>Erosion of Ozone Layer and Global Warming</u>

First Erosion of the Ozone Layer phenomenon

<u>Composition of ozone gas</u>




1-Breaking down the bond of the oxygen molecule O2 when it absorbs the ultraviolet radiation (UV), producing two free active oxygen atoms 2O

$$O_2 \xrightarrow{UV} O + O$$

• Each free oxygen atom combines with an oxygen molecule to produce an ozone molecule

$$O + O_2 \longrightarrow O_3$$

**Importance of Ozone Layer**

Ozone layer does not allow penetration of all far and medium ultraviolet radiations, which have very harmful effects.

**Pollutants of Ozone Layer**

Chlorofluorocarbon compounds (CFC

Methyl bromide: that is used as an insecticide to preserve stored agricultural crops

Halons: that are used in fire extinguishers

Nitrogen oxides: that result from the burning fuel of ultrasound airplanes (Concord

**Second Global Warming**

The most important greenhouse gases

- Carbon dioxide gas $CO_2$. Its ratio increased in the atmosphere to 0.038% in 2005 after it was 0.031%.
- Chlorofluorocarbons CFC compounds
- Methane gas $CH_4$
- Nitrous oxide $N_2O$
- Water vapour $H_2O$

The negative effects of Global Warming Phenomeno

1-Melting of the ice and snow of both South and North Poles:

2-Severe climatic changes

Among these features is the repeated occurrence of tropical hurricanes such as hurricane Katrina in 2005, destroying floods , drought waves and forest fires.

| الكلمة | معناها | الكلمة | معناها |
|---|---|---|---|
| forest fires | | **Global Warming** | |
| drought waves | | **Pollutants** | |
| destroying floods | | Far | |
| tropical hurricanes | | Penetration | |
| Climatic | | Breaking down | |
| greenhouse gases | | **Erosion** | |

## Review of lesson (2)

**□Replace each of the following statements by suitable scientific term:**

**a) A molecule is formed forms combining an atom of an element to a molecule of the same element.**

**b) Continuous increase of the average temperature of the air near the surface of the Earth.**

**□Choose the correct answer from those between brackets:**

**a) Ozone Layer is measured by a unit called …..........…..**
**(Km / Dobson / UV / mm3)**
**b) All are greenhouse gases except ……...........…..**
**($CO_2$ / $O_2$ / $N_2O$ / $CH_4$)**
**□Give reasons for :**

**a) Formation of Ozone Layer in the stratosphere.**

**…………………………………………………………………......…………………............**

**b) Stop building concord airplanes.**

**……………………….....................……………………………………….....…………**

**□Write short note about the negative results of global warming.**

**……………………….....................………………………………………**

# Unit Review

**□Replace each of the following statements by a suitable scientific term:**

**1) The boundary separating between stratosphere and mesosphere where temperature is rather constant. (………….)**
**2) Charged layer reflects radio waves. (………….)**
**3) One of the atmosphere components that its ratio increased in recent years to reach**
**about 0.038%. (………….)**
**4) A type of ultraviolet radiation that is absorbed completely (100%) in the Ozone Layer. (………….)**

**□Complete the following phrases:**

**1) The highest temperature layer in the atmosphere is ………. and the least temperature one is …………..**
**2) Most of weather features occur in …………. layer whereas satellites swim through the ……………. layer.**
**3) Ultraviolet radiation has a …………. effect, and the infrared radiation has a ………. effect.**
**4) Among the pollutants of the Ozone Layer are ………….. compounds that are used in**
**air conditioning sets and …………… compounds that are used in fire extinguishers.**

□Illustrate with formulas only the role of ultraviolet radiation in the formation of Ozone gas.

…………………………………………………………………………………………….

□An aeroplane captain announced that the atmospheric pressure outside the aeroplane is
90 millibar. In which layer of the atmosphere was the plane flying? Why?

………………………………………………………………………………………………

□Compare between mesosphere and thermosphere in terms of temperature, importance,
and air pressure.

…………………………………………………………………………………

□Calculate the height of a mountain if the temperature at its foot is 30º C and at its top is(-6 º C)

……………………………………………………………………………………………………

*******************************************.

# Unit 3

## Fossils and Protecting Species from Extinction

## Lesson 1

## Fossils

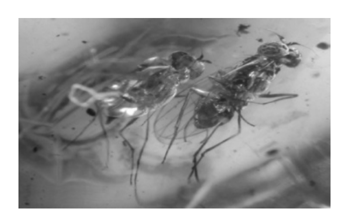
**Fossil concept**

Traces and remains of the old living organisms that are preserved in sedimentary rocks



**Types of fossils and ways of formation**

**First type :Fossil of complete body**
**Examples of a complete body fossil**
□Mammoth fossi
□Amber fossil



**Second type :mold mold carrying the internal details**



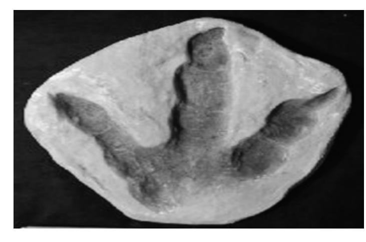
**<u>Third type</u> :cast A replica of the original outer shell shape is formed**



**„[ What a dead body of an organism leaves on sedimentary rocks is <u>called cast</u>**

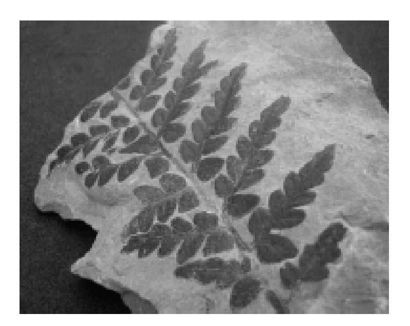


**„[ What a living organism body leaves during its life is known as <u>trace.</u>**

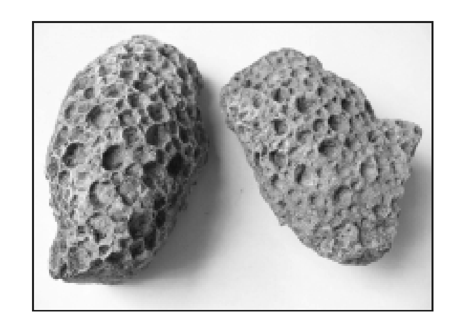


**Exercise (1)**

*Choose the correct term (cast – mold – trace) for each of the following fossils:*



*Fossil .... of ferns*



*Fossil ... of worms' tunnels*



*Fossil .... of trilobite*

**Fourth type : Petrified fossils**

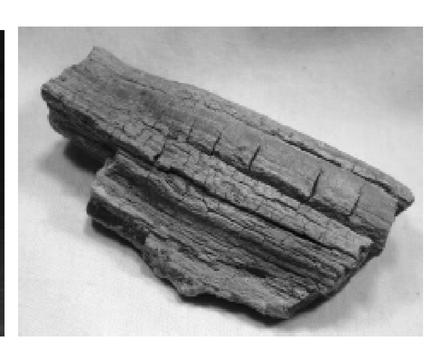
*A type of fossils where the minerals can replace the organic matter of organism part by part without changing the shape, for examples:*



*Dinosaur's tooth*



*Dinosaur's eggs*



*Petrified wood*

□**Petrified** **woods look like rocks but they are fossils <u>because</u> they give us details about once living old plant.**

## <u>petrification</u>

□**Petrified wood was formed by replacing , part by part, of the original wood material by silica,**

## <u>Importance of fossils:</u>

**1-Age determination of sedimentary rocks**

**<u>Index fossils</u>** ***Fossils of the organisms that lived a short period of time in the past and became extinct.***

**2-Figuring out the pale environment التعرف على البيئات القديمة**

**„[ Nummulites fossils:**

**They are found in the limestone rocks of Gebel Mokattam and indicate that there was a sea floor in this area more than 35 million years ago.**

**2□ Ferns fossils:**

**They indicate that the environment where they lived was a hot and rainy tropical environment.**

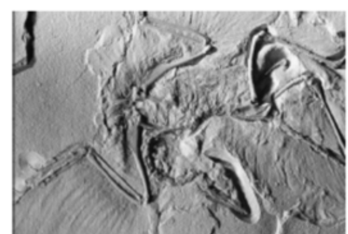
**□ Coral fossils:**

**They indicate that the environment where they lived was clear, warm and shallow seas.**

**3-Studying life evolution**

**Archaeopteryx fossil links between reptiles and birds**

**□ Fish is first vertebrate to appear, followed by amphibians, then reptiles and finally birds and mammals appeared together**



*Archaeopteryx fossil links between reptiles and birds*

**<u>4-Petroleum exploration</u>□microfossils like foraminifera and radiolaria this could be a good indication of the age of the rocks from which they were taken. and the suitable conditions for petroleum formation**

| الكلمة | معناها | الكلمة | معناها |
|---|---|---|---|
| **Fossils** | الحفريات | **petrification** | التحجر |
| **Amber** | الكهرمان | **Index fossils** | الحفريات المرشدة |
| **Mold** | قالب | **Nummulites fossils** | حفريات النيموليت |
| **Replica** | نسخة طبق الأصل | **Ferns fossils** | حفريات السرخسيات |
| **Original** | اصلى | **Coral fossils** | حفريات المرجان |
| **trace.** | اثر | **life evolution** | تطور الحياة |
| **suitable conditions** | شروط مناسبة | **indication** | دلالة |
| **petroleum formation** | تكوين البترول | **cast** | طابع |

## Review of lesson 1

**1 Write the scientific term for each of the following statements:**

**(1) Remains of old organisms that lived in the past for a certain period and then became extinct.**
**(2) Replacing, part by part, the wood material of trees by silica to form petrified woods.**

**2 Complete the following phrases:**

**(1) Archaeopteryx represents the link between …………….. and...……………......................**

**(2) Fossils are used in …………… exploration and determining the age of……..**

**□Choose the correct answer from between brackets:**
**(1) …………….. is an example of microfossils.**
**(Mammoth / Ferns / Foraminifera / archaeopteryx)**
**(2) Complete fossils of insects are found preserved in**
**(ammonites / amber / igneous rocks / ambergris)**

**□Mention the importance of each of the following:**

**(1) Coral fossil**

**………………………………………………………....................................……..**

**(2) Nummulites fossil**

**……………………….................……….……..……………………........**

**□What is the difference between ?**
**(1) Remains and trace.**

**…………………………………………………………..…………………….................**

**(2) Mold and cast.**

**…………………………………………………………..……………......................…**

**□Give reasons for:**

**(1) Naming the petrified forests with wood mountain.**

**…………………...………………………………………………………..............…**

**(2) Gebel El-Mokattam was once a sea floor more than 35 million years ago.**

**************************************************************

## Lesson 2 Extinction

**Concept of extinction**

**The continuous decrease without compensation in the number of a certain species of living organisms until all members die out.**

**Factors causing extinction of species:**

**1-Destroying natural habitat**

**2-Overhunting :**

**3-Environmental pollution:**

**4-Climatic changes and natural disasters**

**First:Extinct species**

**□Dodo bird :**

**□Quagga**

**□Passenger pigeon:**

**Its extinction is attributed to cutting the oak and beech trees where they used to build their nests , Mass hunting of the bird and, Its female lays only one egg each spring.**

**This animal has a wolf's head, dog's tail, a pouch like kangaroo, and striped skin like a tiger**



□**Golden frog :**

**<u>Second :The endangered species</u>**

□**Panda bear :**

□**Rhinoceros:**
**is endangered because its habitat is being transformed into cultivated land as well as it is being over hunted for, using its horn for medical purposes.**

□**Bald eagle:** **It is endangered because it feeds on fish that contain poisonous matter that is being dumped in lakes and rivers.**

□**Ibis bird:**

□**Papyrus plant:**

**<u>Effect of extinction on the ecological equilibrium :</u>**

**<u>The simple ecosystem</u> (few members) is severely affected by the absence of one type of species of organisms because of the rarity of alternative that compensates this absence**
**as in the case of the desert ecosystem**

**<u>The complicated ecosystem</u> (multiple members) is not affected much by the absence of a species of the living organisms because it has many alternatives as in the case of the tropical forest ecosystem**

**Ways to protect living organisms from extinction :**

**<u>Natural protectorates</u> are safe areas established to protect endangered species in their homeland.**

**<u>Ras Mohamed</u> protectorate is the first established protectorate in Egypt. This was in 1983. It is characterized by the presence of rare coral reefs and coloured fish.**

**<u>Wadi El-Raiyan</u> Protectorate in Fayoum, as the best world heritage of whales' skeletons. It containscomplete whales'skeletons fossils**

## Review on lesson 2

**□Choose the correct answer from between brackets:**

**(1) ……….. indicate(s) extinction.**
**(Fossils / Protectorates / Evolution / Ecological equilibrium)**

**(2) ………. protectorate is the first established natural protectorate in Egypt.**
**(Saint Cathrine / Ras Mohamed / Wadi Hetan / Petrified forest)**

**□Write the scientific term for each of the following statements:**

**(1) The death of all members of species of living organisms. (………..…)**

**(2) Extinct animal has a wolf's head, a dog's tail and a tiger's skin. (………..…)**

**□Explain the effect of extinction of a species of living organisms on:**

**(1) Simple ecosystem ……………………………………………………………………**

**(2) Complicated ecosystem …………………………………………………………………**

**□Mention what characterize each of the following:**

**(1) Ras Mohamed protectorate.**

**(2) Wadi Hetan area.**

**□Exclude the unsuitable word and mention what the rest has in common:**

**(1) Dodo / Quagga / Bald eagle / Tasmanian cat.**

**………………………………………………….....................…………………**

**(2) Panda / Rhinoceros / Golden frog / Bald eagle**

**………………………………………………….....………........................**

**□Give reasons for:**

**(1) Removing trees of tropical forests is one of the most important factors of extinction.**

**………………………………………………………………………………..............…**

**(2) The desert ecosystem is significantly affected by the absence of one of its species.**

**………………………………………………………………………...........…………**

# First Term Review

**□ Choose the correct answer between brackets :**

**□ .......... form positively charged ions when they enter in the chemical reactions.**
**( Inert gases - Nonmetal - Halogens - Alkali metals )**

**□ The elements of group (17) are called ..........**
**( alkali metals - halogens - inert gases - alkaline Earth metals )**

**□ Meteors are formed in ..........**
**( exosphere - thermosphere - mesosphere - stratosphere )**

**□ .......... is one of the most important causes of the recent extinction age.**
**( Volcanic eruption - Falling of icebergs - Falling of meteorites - Overhunting and environmental pollution )**

**□ Write the chemical equations representing the following :**

**□ Dissolving of magnessium oxide in water.**

**.......................................................................................................................................**

**□ The reaction between chlorine gas and potassium bromide.**

**.......................................................................................................................................**

**□ The electrolysis of water.**

**.......................................................................................................................................**

**□ Mention one difference between each of :**

**□ Flourine molecule and helium molecule.**

**.......................................................................................................................................**

**□ Natural and industrial water pollutants.**

**.......................................................................................................................................**

**□ Troposphere and stratosphere.**

**□ Simple and complicated ecosystems.**

**□ Give reasons :**

**□ Water molecule is from the polar molecules.**

**.......................................................................................................................................**

**□ Sodium is kept in kerosene.**

**□ The lower part of stratosphere is suitable for plane flying.**

**.......................................................................................................................................**

**□ The bald eagle is one of the endangered species.**

**□ To who are these works/achievements attributed ?**

**□ The discovery that the nucleus of the atom contains positively charged protons.**

**.......................................................................................................................................**

**□ The discovery of the existence of two magnetic belts around planet Earth.**

**.......................................................................................................................................**

**□ Issuing a red list for the endangered species.**

# Question bank of science

,mnn

**1-Choose the correct answer between bracktes:**

**(1) Each period in the modern periodic table starts with .......... element.**

**( metallic - semimetallic - nonmetallic - inert )**

**(2) In the same period, the element which has the highest electro negativity lies in group .......... (0 - 7 A - 2 A - 1 A)**

**(3) When sodium react with water .......... gas evolves. (O2 - CO2 - H2 -N2)**

**(4) A liquid boils at 100 °C, what is the other property which affirm it is a pure water**

**(Sugar dissolves in it / when it freezers , denstiy decreases / neutral on both litmus paper / it evaporates on heating)**

**(5) Scientists ..................... discovered the main energy levels in the atom**

**(Bohr / Mendeleev / Mosely / Hoffman)**

**(6) Sodium oxide from .................... oxides (amphoteric / acidic / nonmetallic / basic)**

**(7) All the following elements from semimetals except for ....................**

**(teleriun / silicorn / boron / bromine)**

**(8) The strongest metal lies in the .................. group. (2A / 1A / 1B / 7A)**

**9) -Normal atmospheric pressure equals ……………. millibar.**

**(1013.25 / 76 / 1.013 / 760)**

**10)- …………. is located between stratosphere and mesosphere.**

**(Tropopause / Stratopause / Mesopause / Thermopause)**

**11)- Meteors burn in ……………**

**(mesosphere / ionosphere / exosphere / stratosphere)**

**12) Ozone Layer is measured by a unit called …..........…..**
**(Km / Dobson / UV / mm3)**

**13) All are greenhouse gases except ……...........…..**
**($CO_2$ / $O_2$ / $N_2O$ / $CH_4$)**

**(14) …………….. is an example of microfossils.**
**(Mammoth / Ferns / Foraminifera / archaeopteryx)**

**(15) Complete fossils of insects are found preserved in**
**(ammonites / amber / igneous rocks / ambergris**

**16) ……….. indicate(s) extinction.**

**(Fossils / Protectorates / Evolution / Ecological equilibrium)**

**(17) ………. protectorate is the first established natural protectorate in Egypt.**

**(Saint Cathrine / Ras Mohamed / Wadi Hetan / Petrified forest)**

**18).......... form positively charged ions when they enter in the chemical reactions.**

**( Inert gases - Nonmetal - Halogens - Alkali metals )**

**19)The elements of group (17) are called ..........**

**( alkali metals - halogens - inert gases - alkaline Earth metals )**

**20) Meteors are formed in ..........**

**( exosphere - thermosphere - mesosphere - stratosphere )**

**21) .......... is one of the most important causes of the recent extinction age.**

**( Volcanic eruption - Falling of icebergs - Falling of meteorites - Overhunting and environmental pollution )**

**22)The number of known elements is.......**

**a- 216 b-116 c-316 d-16**

**23) The number of negative electrons in the atom in its normal state equals**

**a- number of protons. b- number of neutrons.**

**c- twice the number of protons. d- half the number of neutrons.**

**24)The atomic number of the elements equals:**

**a- The sum of neutron numbers inside the nucleus.**

**b- Sum of the number of electrons which rotate in the energy levels**

**c- The number of protons inside the nucleus.**

**d- b&c are correct.**

**25)The density of pure water in solid state is:**

**a- Less than its density in liquid state.**

**b- Equal to its density in vapour state.**

**c- Greater than its density in liquid state.**

**d- Greater than its density in vapour state.**

**26) From the most common recently extinct species is........**

**a- Dodo bird. b- Quagga.**

**c- Golden frog. d- All the previous.**

**(27) All of the following are from the properties of water except ................**

**(neutral on both litmus paper / analysis by heat / increase in volume on heating / polar compound)**

❶ In the periodic table, the elements which are identical in properties lie in the same:

a- Period b- Group c- Nucleus d- Energy level.

❷ The scientist who left vacancies in his table to be filled with suitable discovered elements in future is:

a- Mosely b- Newlander c- Bohr d- Mendeleev.

❸ The block which contains the groups 1A, 2A in the periodic table is:

a- S b- P c- d d- f

❹ The elements which occupy the middle block (d) in the periodic table is …… elements.

a- alkali b- alkaline earth c- transition d- inert

❺ The scientist who discovered the main energy levels is:

a- Mendeleev b- Bohr c- Moseley d- Rutherford

❻ Which of the following belongs to the same group in the periodic table?

a- Na, C b- Na, Li c- Na, Cu d- Na, Ne

❼ The scientist who discovered that the nucleus of the atom contains positively charged particles is:

a- Mendeleev b- Moseley c- Rutherford d- Bohr

❽ The element which its atomic number (18) is :

a- Transitional element b- Inert gas

c- Metallic element d- Halogen element

❾ The element which its atomic number is (17) is similar in its chemical construction to the element which its atomic number is:

a- 2 b- 7 c-9 d- 19

❿ The 3rd period starts with elements their oxides are as following:

a- Acidic, amphotoric then basic b- Acidic, basic then amphotoric

c- Basic, acidic then amphotoric d- Basic, amphotoric then acidic

⓫ Metal oxides are …………… oxides.

a- acidic b- basic c- amphotoric d- neutral

12. The elements of 1st group are known as:

a- Halogens b- Inert gas c- Alkalines d- alkaline earth

13. The hydrogen element belongs to:

a- Group 1A b- Group 2A c- Group 7A d- Group 6A

14. The strongest alkaline earth metal in reaction with water is

a- magnesium b- calcium c- barium d- sodium

15. The hottest atmospheric layer is:

a- troposphere b- stratosphere

c- mesosphere d- thermosphere

16. The coolest atmospheric layer is:

a- troposphere b- stratosphere

c- mesosphere d- thermosphere

17. The planes fly in the ……… layer.

a- troposphere b- stratosphere

c- mesosphere d- thermosphere

---

18. The device used in measuring the atmospheric pressure is:

a- Altimeter b- Aneroid c- Barometer d- a and b

19. …………… layer extends from the sea level to the tropopause.

a- Troposphere b- Stratosphere

c- Mesosphere d- Thermosphere

20. The device used in measuring the altitude from the earth surface is.......

a- the altimeter b- Aneroid c- Barometer d- a and b

21. The ………. layer extends from the tropopause to the stratosphere.

a- troposphere b- stratosphere

c- mesosphere d- thermosphere

22. The charged cosmic radiations are dispersed in the ………. layer.

a- troposphere b- stratosphere c- mesosphere d- ionosphere

23. The ………. layer extends from the stratopause to the mesopause.

a- troposphere b- stratosphere

c- mesosphere d- thermosphere

24 The…….. is much vacuumed layer.

a- troposphere b- stratosphere

c- mesosphere d- thermosphere

25 The temperature decreases by ………………. at 2 Km above earth surface.

a- 6.5°C b- 13°C c- 5.6°C d-9.75°C

26 The atmospheric pressure is the ……………… of an air column per a unit area.

a- mass b- volume c- weight d- density

27 Meteors are burnt in the layer ……………… .

a- troposphere b-stratosphere

c- mesosphere d- thermosphere

28 The ionosphere is located in the upper part of the ………….. layer.

a- troposphere b- stratosphere

c- mesosphere d- thermosphere

29 The air moves ………….. in the stratosphere layer.

a- horizontally b- vertically

c- vortical d- no correct answe

30 The ionosphere is surrounded by two………… belts.

a- magnetic b- electrical c- ionic d- thermal

31 The atmospheric pressure on the top of a mountain …………….the atmospheric pressure at the sea level.

a- is greater than b- is less than

c- equals d- equals half of

32 The standard atmospheric pressure at the sea level is ………. Millibar. *

a- 76 b- 1000 c- 1013.25 d- 1300

33 The………….. is considered the 1st atmospheric layer of the atmospheric layers.

a- troposphere b- stratosphere

c- mesosphere d- thermosphere

34 The ……….. is considered the 2nd atmospheric layer of the atmospheric layers.

a- troposphere b- stratosphere

c- mesosphere d- thermosphere

35 The Ozone layer is in the…………….

a- troposphere b- stratosphere

c- mesosphere d- thermosphere

36. The ozone molecule consists of ……………. .

a- four oxygen atoms
b- two oxygen atoms
c- three oxygen atoms
d- one oxygen atom

37. The ozone layer absorbs ………………… .

a- Infrared rays
b-ultraviolet rays
c- X-rays
d- light rays

38. The ozone hole appears over ……………. .

a- the North Pole
b- the South Pole
c- the Middle East
d- the Equator

39. The ………….. is used in extinguish fires.

a- methyl bromide gas
b- halons
c- nitrogen oxide
d- ultraviolet rays

40. The CFCs compounds break down under the effect of ultraviolet rays to release ………….. atoms.

a- carbon
b- chloride
c- oxygen
d- Freon

41. ……………… is considered one of the chlorofluorocarbon compounds.

a- Ozone $O_3$
b- Oxygen $O_2$
c- Water vapour $H_2O$
d- Nothing above

42. The ozone layer doesn't allow the passage of …………. ultraviolet rays.

a- far
b- medium
c- a&b together
d- near

## Give reasons :

**1)Water molecule is from the polar molecules.**

..........................................................................................................................

**2)Sodium is kept in kerosene.**

**3)The lower part of stratosphere is suitable for plane flying.**

..........................................................................................................................

**4)The bald eagle is one of the endangered species.**

..........................................................................................................................

**5)Removing trees of tropical forests is one of the most important factors of extinction.**

……………………………………………………………………………………….............…

**(6) The desert ecosystem is significantly affected by the absence of one of its species.**
**Naming the petrified forests with wood mountain.**

…………………...…………………………………………………………….............…

**(7) Gebel El-Mokattam was once a sea floor more than 35 million years ago.**

**8)The lower part of the stratosphere is suitable for flying airplanes.**

**…………………………………………………………………………………...…..**

**9) Ionosphere is important for radio stations.**

**…………………………………………………………………………………...…..**

**10)The use of radio active Co 60 in food preservation.**

**........................................................................................................................................**

**(11) Elements of the same group have similar properties.**

**........................................................................................................................................**

**(12) The boiling point of water is high.**

**........................................................................................................................................**

**(13) Alkali metals are kept under kerosene in the lab.**

**........................................................................................................................................**

**(14)Presence of hydrogen bond between water molecule.**

**.......................................................................................................................................**

**(15) Pure water doesn’t affect litmus paper dye.**

**.......................................................................................................................................**

**(16) Although sugar is a covalent compound , it dissolves in water.**

*****************************************************************************

**<u>What is meant by ?</u>**

**(1) Chemical activity series?**

**...............................................................................................**

**(2) Water pollution?**

**..............................................................................................................**

**(3) Semimetals?**

**...................................................................................................................**

**(4)Atmospheric pressure.**

**………………………………………………**

**(5) The aurora phenomenon.**

**……………………………………..........…**

## <u>What is the difference between ?</u>

**(1) Remains and trace.**

**……………………………………………………...………………….................**

**(2) Mold and cast.**

**……………………………………………………….………………...................…**

**……………………………………………………………………………………..**

**(3) Flourine molecule and helium molecule.**

**....................................................................................................................**

**………………………………………………………………………………………**

**(4) Natural and industrial water pollutants.**

**....................................................................................................................**

**……………………………………………………………………………………..**

**(5) Troposphere and stratosphere.**

**…………………………………………………………………………………………**

**……………………………………………………………………………………….**

**(6) Simple and complicated ecosystems.**

**.................................................................................................................................**

**.................................................................................................................................**

**....**

**************************************************************************

**<u>Locate the position of the following elements in the modern periodic table :</u>**

**(1) $_{1}H$ ....................................**

**(2) $_{10}Ne$ ....................................**

**(3) $_{20}Ca$ ....................................**

**<u>Find the atomic number for the□ following elements.</u>**

**(1) Element X lies in the first period and zero group .........**

**(2) Element Y lies in the second period and 3A group .........**

**(3) Element Z lies in the third period and 7A group .......**

**Write the balanced chemical equations which express reaction of :**

**(1) Carbon dioxide with water.**

**…………………………………………………………………………..**

**(2) Magnesium with dil. hydrochloric acid. Dissolving of magnessium oxide in water.**

**.....................................................................................................................**

**(3) The reaction between chlorine gas and potassium bromide.□**

**.....................................................................................................................**

**(4) The electrolysis of water.**

**.....................................................................................................................**

**Write the scientific term for each of the following□ statements:**

**(1) The death of all members of species of living organisms. (………..…)**
**(2) Extinct animal has a wolf's head, a dog's tail and a tiger's skin. (………..…)**
**(3) Remains of old organisms that lived in the past for a certain period and then became extinct.**
**(4) Replacing, part by part, the wood material of trees by silica to form petrified woods.**

**5) The boundary separating between stratosphere and mesosphere where temperature is rather constant. (………….)**
**6) Charged layer reflects radio waves. (………….)**
**7) One of the atmosphere components that its ratio increased in recent years to reach**
**about 0.038%. (………….)**
**8) A type of ultraviolet radiation that is absorbed completely (100%) in the Ozone Layer. (………….)**
**9) The boundary separating between stratosphere and mesosphere where temperature is rather constant. (………….)**
**10) Charged layer reflects radio waves. (………….)**
**11) One of the atmosphere components that its ratio increased in recent years to reach**
**about 0.038%. (………….)**
**12) A type of ultraviolet radiation that is absorbed completely (100%) in the Ozone Layer. (………….)**
**13) The ascending order of the elements according to their atomic mass (………..).**
**14) The ascending order of the elements according to their atomic number (………..).**
**15) The horizontal rows in the Mandeleev's table (………….).**

**16) The vertical columns in the Mandeleev's table (…………).**
**17) Indicated by the letter K, L, M, N, O. (………………).**
**18) Indicated by the letter S, P, d, F (………………).**
**19) A kind of elements symbolized by the letter B (…………….).**
**20) The block that contains the groups from 3A to 6A. (……………..).**
**21) The block that contains the series of luthanides and actinides (……………..).**
**22) The ability of the atom in the covalent molecule to attract the chemical bond electron to it.**
**23) A kind of oxide reacts as basic oxides or acidic oxides according to the reaction condition.**
**24) A kind of elements in which their valency electrons contain less than 4 electrons.**
**25) A group that contains the strongest non-metals.**
**26) The block that contains the groups from 3A-7A**
**27) The region between mesosphere and thermosphere.**
**28) The $4^{th}$ layer of the atmospheric envelope.**
**29) A device used to measure the altitude from the earths surface.**
**30) A layer of the atmospheric envelope in which air moves vertically.**
**31) Two magnetic belts help in dispersing the harmful cosmic radiation away from the earth.**
**32) The phenomenon looks like a colorful light curtain seen at the two poles.**
**33) The atmospheric envelope layer that contains a certain amount of helium and hydrogen gas only.**
**34) The region where the atmospheric envelop merges with the outer space.**
**35) The phenomenon that increases the percentage of carbon dioxide and leads to an increase in temperature.**
**36) A kind of gas formed in the stratosphere.**
**37) The gas resulting from the reaction of a chlorine atom with ozone gas.**
**38) A kind of ray that causes the rising of temperature in the troposphere layer.**
**39) The traces and remains of the old living organisms which are preserved in sedimentary rocks.**
**40) The traces that indicate the activity of the living organism during their life.**
**41) The traces that indicate the remains of the old living organism after their death.**
**42) The process of conservation of the parts of old living organisms in the solidified materials as a result of replacing the organic material of the organism with minerals.**
**43) Fossils of living organisms lived for a short period of time and in a wide geographical range.**
**44) The fossils present in the rocks of different regions and they indicate the evolution and extinction of living organism.**
**45) The continuous decrease in the number of individuals from the same species of living organisms without compensation with birthing.**
**46) Hunting wild animals with a random unorganized way which exposes it to extinction.**
**47) The path which energy takes when transporting from one living organism to another one inside the environmental system.**
**48) The environmental system that is affected severely by the absence of one species of the living organism that live in it.**

49) The environmental system that is not affected severely by the absence of one species of the living organism that live in it.
50) Safe places that are specified to protect the endangered species in their natural environment.

.....................................................................................................

## □**Complete**:

**(1) Mendeleev arranged the elements ascendingly according to .........**

**while Moseley arranged them ascendingly according to .........**

**(2) The modern periodic table consists of ......... horizontal periods , ......... vertical**

**groups.**

**3) The highest temperature layer in the atmosphere is ………. and the least temperature one is …………..**
**4) Most of weather features occur in …………. layer whereas satellites swim through the ……………. layer.**
**5) Ultraviolet radiation has a …………. effect, and the infrared radiation has a ………. effect.**
**6) Among the pollutants of the Ozone Layer are ………….. compounds that are used in**
**air conditioning sets and …………… compounds that are used in fire extinguishers.**
**(7) Archaeopteryx represents the link between ……………..and.........................**

**(8) Fossils are used in …………… exploration and determining the age of……..**

**(9) In Mendeleev's table the elements are arranged ………….. according to their atomic weight.**
**(10) The Newzealand scientist Rutherford discovered that the atom contains …………. Of positive charge.**
**(11)The alkali metal elements are ………….. valent.**
**(12)Halogens lie in the elements of ………….. group.**

**Mark sign (√) in front of the correct answer and sign (x) in front of the wrong ones in the following.**

1) **The chemical elements have been categorized in the table to ease its studying.**
2) **The elements with the same physical and chemical properties has been put in horizontal periods.**
3) **Mendeleev arranged the elements in a descending order according to their mass.**
4) **Mendeleev put more than element in the same place like nickel and cobalt.**
5) **Rutherford discovered that the nucleus contains +ve charged protons.**
6) **The atomic number of every element increases by one over the element that precedes in the same period.**
7) **Bohr had discovered the main energy level.**
8) **Then transitional elements groups are symbolized by (d).**
9) **The number of known elements till now is 92 elements.**
10) **The atomic size decreases in the periods as the atomic number increases.**
11) **In water the molecule the oxygen element has more affinity to attract the bonding electrons than the hydrogen element.**
12) **The covalent bond becomes ionic when the difference in electronic negativity between the bonded atoms = zero.**
13) **It is easy to identify the semi-metals from their electronic structure.**
14) **Each period starts with a weak metal.**
15) **The metallic property in the group (1A) increase as we go from up to down in the group.**
16) **50% of the mass of the atmospheric envelope is in some area in between the sea level and a 3 Km elevation.**
17) **The troposphere is the 1$^{st}$ layer in the atmosphere envelope.**
18) **All the atmospheric phenomena like rain, wind and clouds occur in the ionosphere.**
19) **The mesosphere is the coolest region in the atmospheric envelope.**
20) **The satellites revolve around the earth in a region called the exosphere.**
21) **The standard atmospheric pressure at sea level equals 76 millibar.**
22) **The temperature in the troposphere decrease at a rate of 6.5 degree each 1Km up.**
23) **The ionosphere is surrounded by Van Ellen's belt which is responsible for scattering the harmful cosmic rays away from earth.**
24) **The stratosphere is the 3$^{rd}$ layer in the atmospheric envelope.**
25) **The air moves horizontally in the bottom part of the stratosphere.**
26) **The altimeter is used to determine the elevation of airplanes from the sea level.**
27) **The Aurora phenomenon appears as a colored light curtains at the north and south poles.**
28) **The pilots prefer to fly their airplanes in the upper layer of the mesosphere.**

**29) The air moves vertically in the stratosphere.**
**30) The ozone layer is in the stratosphere.**
**31) The millibar is the unit of measure in the ozone degree.**
**32) The increase of carbon dioxide percentage in the atmospheric envelope leads to the increase in temperature.**
**33) Lacking of plants on earth leads to increase in temperature.**
**34) The extinction of some polar animals is from the negative effect of the global warming phenomenon.**
**35) The ozone layer allows the passage of all ultraviolet rays near and medium.**
**36) The ozone layer acts as a protective shield for the living organism.**
**37) The halons are produced from the burning of supersonic airplanes fuel.**
**38) The world celebrates 'Ozone Day' in December each year.**
**39) Methyl bromide is used in fire extinguishers.**
**40) Nitrogen oxide results from fuel burning.**
**41) The ozone layer erosion differs every year.**
**42) The methane gas and nitrous oxide are considered to be green houses gases.**
**43) The ozone molecules are formed by bonding three free oxygen atoms together.**
**44) The ozone layer lies at altitude of approximately 20-30km above sea level.**
**45) The far and medium ultra-violet rays cause skin cancer and cataracts to humans.**
**46) The Freon is used as a coolant in cooling devices.**
**47) Methyl bromide is used as an insecticide.**
**48) The ultraviolet rays break chlorofluorocarbon compounds to release active chlorine atoms.**
**49) From the negative effects of climatic changes the happening of tropical hurricanes destructive floods , drought waves and forests fires.**
**50) The alkaline earth metals are good conductors of heat and electricity**

# Exam (1)

1st question:

Complete the following sentences:

1. Mendeleev organized the elements according to the similarity in …………….. .
2. The ozone layer disperses the ……………. rays away from the earth's surface.
3. From the extincted animals in the old ages ………. and …………… .
4. Sodium is kept under the surface of ………… so as not to react with …………… .

2nd question:

Choose the right answer:

1. The transitional elements start to appear from the beginning of the……. period.

   a- second b- third c- fourth d- fifth

2. The extinction of Tasmanian cat is because of ………… .

   a- overhunting b- the destruction of original inhabitant

   c- environmental pollution d- climatic changes

3. The second layer of the atmospheric envelope is called ………….. .

   a- stratosphere b- thermosphere

   c- troposphere d-mesosphere

4. The snow crystal's shape is …………… .

   a- hexagon b-pentagon c-Octagonal d- quadrilateral

5. The fossils exist in the sedimentary rocks in the Mokattam Mountain are

   a- Ferns b-Coral c-Nummiulite d- all the previous

6. From the endangered species:

   a- The bold eagle. b- The passenger pigeon.

   c- Tasmanian. d- Dinosaur.

3rd question:

Give reasons for:

1. Liquefied nitrogen is used in preserving cornea.
2. The lower part of the stratosphere layer is suitable for airplanes flying.
3. Petrified wood is considered from fossils.

4th question:

Put (√) in front of the right statement and (X) in front of the wrong ones in the following:

1. The elements of block "P" are organized in 5 groups. ( )
2. The index fossil indicates the age of the sedimentary rock. ( )
3. The halons are produced from supersonic airplanes. ( )
4. The altimeter is a device used to measure the altitude of planes on the knowledge of atmospheric pressure. ( )
5. The elements of group (1A) and (2A) are good conductors for heat and electricity. ( )
6. The atmospheric pressure decrease by increasing the altitude from the sea level. ( )

# Exam (2)

1st question:

A- Choose the right answer:

1. There are ……………. bonds between water molecules.

   a- metallic   b- ionic   c- hydrogen   d- covalent

2. The air in the troposphere layer moves ………. .

   a- horizontally   b- vertically   c- inclined   d- no right answer

3. The volume of hydrogen gas evolving from water electrolysis equals………. the oxygen volume.

   a- that of   b- double   c- half   d- four times

4. The second layer of the atmospheric envelope is called ………….. .

   a- thermosphere   b- stratosphere   c-troposphere   d- mesosphere

B- The element ($_{17}Y$) from the elements of the periodic table; find:

1- Electronic distribution.   2- The group number.

3- The periodic number.

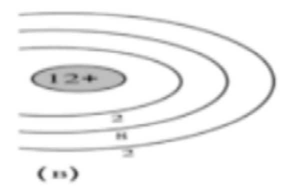
2nd question:

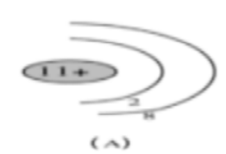
A- Put (√) in front of the right statement and (X) in front of the wrong ones:

1. The earth alkalines are good heat conductors.
2. The atmospheric pressure decreases as the altitude from sea level increases.
3. As the atomic number increases the metallic property increases.
4. The index fossil indicates the age of sedimentary rocks.
5. The ionosphere is surrounded by two magnetic belts known as Van Ilene's belt.

B- See the figure then answer:

1. Which one of the two graphs represents a +ve ion?
2. Which one of the two graphs represents a neutral ion?
3. Indicate the position of the atom in the periodic table (period-group)



3rd question:

Write the scientific term for each of the following:

1. The continuous decrease in the number of individuals of the same species of living organisms without compensation until all individuals die.
2. A bird with small wings and short legs extincted from the Indian islands.
3. The ability of the atom in covalent molecule to attract the chemical; bond electrons to it.
4. Elements in block "S" and they are dicovalent and lie in the second group of the periodic table.
5. Safe places are specialized for protecting endangered species in their original inhabitant.

4th question:

Complete the following statements:

1. The electro negativity in the modern periodic table increases from …………. to …………… inside the same group.
2. The last level of metallic elements contain ……………. than four electrons when the non-metallic elements contain …………….. than four electron in their last level.
3. The ozone layer is in the …… layer.
4. Fossils always exist in the ……. rocks.
5. The elements of group 7A are called …………… .
6. …………. is considered from the safe places that has endangered species.
7. The bond between water molecules is called ………….. bond.
8. What is left by the living organism's body after its death in the sedimentary rocks is known as ………………. .

